HERNIA.

A COMPARISON OF THE VARIOUS METHODS ADOPTED FOR ITS CURE; INVITING DISCUSSION OF THEIR RESPECTIVE MERITS.

BY

CLAUDIUS H. MASTIN, M.D., LL.D. Univ. Penna.

OF MOBILE, ALA.

HERNIA.

A COMPARISON OF THE VARIOUS METHODS ADOPTED FOR ITS CURE; INVITING DISCUSSION OF THEIR RESPECTIVE MERITS

Levi C. Lane M.D.
Lincoln regards of
the Author -

BY

CLAUDIUS H. MASTIN, M.D., LL.D. Univ. Penna.

OF MOBILE, ALA.

REPRINTED FROM THE
TRANSACTIONS OF THE AMERICAN SURGICAL ASSOCIATION,
MAY, 1889.

PHILADELPHIA:
WM. J. DORNAN, PRINTER.
1889.

HERNIA.

A COMPARISON OF THE VARIOUS METHODS ADOPTE FOR ITS CURE; INVITING DISCUSSION OF THEIR RESPECTIVE MERITS.

BY

CLAUDIUS H. MASTIN, M.D., LL.D. Univ. Penna.

OF MOBILE, ALA.

truss will give place to the more rational treatment by the knife used under the security of antiseptic precautions.

The unsatisfactory results of palliative treatment naturally called for more radical methods, and, as far back as the time of Celsus, we find this elegant author teaching the use of the knife and the ligature as the means by which the sufferer is to be relieved. As he was the first who described the surgical relations of the investments of the groin, it was very natural that he should have given much attention to the relief of so common a malady as hernia; this he did, but his method consisted of little more than cutting down upon the sac, dissecting out the membranes, then cauterizing, and closing the parts with a suture. If the patient was a child, he cut away the testicle, but preserved it in men; when the omentum occupied the sac, and he was unable to return it, it was excised after being carefully ligated.

Then came Paulus Ægineta, who makes no reference to the work of Celsus, but uses the ligature, as did Galen, tying the cord together with the skin at the external ring. The Arabian surgeons had long been using astringents and the actual cautery as topical applications—indeed, for long ages the potential cautery was the favorite remedy.

The next remedy we hear of is the "royal stitch," attributed to Maupas, and so called because it qualified the king's lieges for military service. It was done by opening the canal and then stitching together the sac and the pillars. Lafranc had resorted to castration, and then plugging the wound and the canal with the stump of the cord; whilst Guy de Chauliac was using caustics, inviting suppuration and insisting upon rest in bed until consolidation of the tissues was accomplished. About this time Bernard Metis operated by ligating the cord with a gold thread and then completing his incision. This last was very similar, in many respects, to the operation of Ambrose Parè—known as the "punctum aureum"—which consisted in passing a gold wire behind the sac at the external ring, including the cord, and then twisting it tight enough to close the hernial sac, yet not sufficiently so to produce strangulation of circulation in the testicle; thus showing some little respect for

the integrity of the seminal gland, which, during the seventeenth century was so often cut away with the sac that Dionis asserts "the itinerant operators were in the habit of feeding their dogs with the organs which they removed."

If time would permit, it might prove interesting to follow up the various modifications resorted to by the old surgeons, to show what was done in the middle ages by the travelling herniotomists, gradually lead the reader up to the time when Pierre Franco's treatise revealed the true nature of hernia, and paved the way for its proper treatment; but we must now content ourselves by referring those who are curious in these matters to the interesting history by Sprengel. It will, for the present, suffice our purpose to group them together as follows:

1st. The Celsean method, incision, castration, cauterization, and bandage.

2d. Cauterization by acids and moxas.

3d. Topical applications, as poultices and plasters.

4th. Ligature of the sac.

5th. The royal suture.

6th. The scarifications of Le Blanc.

7th. Invagination without suture.

8th. Invagination with suture.

The most important of which are the last two, since they form the basis of the operations of Gerdy, Wutzer, and other operators of later years.

Schunmucker, Langenbeck, and others had been in the habit of exposing the sac by a free incision, and then ligating it without inclosing the cord; but a mortality of 3 in every 10, in the hands of Arnot, Armont, and Petit in France, and Sharp and Abernethy in England, caused the operation to fall into disuse, as it was considered dangerous, and, as such, was abandoned. Resort was now had to the "truss cure," using a strong and light spring with a hard pad, which, failing in its object, in turn fell into disrepute.

The next in order came the dealing with the interior of the sac itself; the introduction of solid substances, threads, sponge, isinglass; little bladders of gold-beaters' skin by Belmas,

Schah, and Riggs; the use of stimulating injections, as cantharides, iodine, and such like articles were proposed by Velpeau and used by Pancoast in 1835, followed by fatal results, although in 1840 it had become the favorite method in Paris. In America, Dr. Jayne, of Illinois, used it extensively, and, according to his reports, with most favorable results.

About this time the secret method of Heaton came in vogue, and numbers of successful cures were reported; however, as his method was not at first given to the profession, it did not become in general use, although the treatment by injections was revived, and numberless trocars, canulas, syringes, etc., were invented by Ricord, Jobert, Nélaton, and others, and many began the cure of hernia by injections. At first only cures were reported, but then deaths began to follow in quick succession, and the operation lost favor. The substance used as the injection by Heaton was not known, and consequently those who attempted to cure hernia by injections were not successful as he had been with his mild fluid of quercus alba. After years had passed away, Dr. Joseph H. Warren, of Boston, obtained from Heaton his formula and gave it to the profession. Dr. Warren then invented a screw syringe and began the treatment of the disease; he subsequently wrote and published an interesting brochure upon the method of Heaton as improved by himself, and recorded a number of cures. Notwithstanding his success, I am induced to think the operation has not gained very general favor, and, with the exception of Dr. George W. Gay, of Boston, I am not apprised if it is used at all at this date. Dr. Gay has had a large experience with the method, and his success has been reported as great.

The subcutaneous operation, which in the form of invagination with suture had long been in vogue even among the ancients, was revived by Gerdy; using his finger, he pushed up the integuments into the canal and fastened them with a suture, but his operation failed and was abandoned. Then Wutzer substituted a wooden plug with a clamp and a flat needle; this, in its turn, was discarded, more on account of failures than for the mortality which followed. Rothmund, Sigmund, and Spencer

Wells used it extensively, and their failures were attributed to suppuration and descent of the invaginated portion; their apparent cures were temporary, and the method soon fell into discredit. A modification of this method by Prof. D. Hayes Agnew has been advocated, but I do not think it has met with general favor. Neither has the operation of Spanton, with his "*strephotome*"—a sort of corkscrew needle with which he hems up the pillars subcutaneously, using a catgut thread. He reported thirty-four operations, with no deaths, but showed no evidence of permanent cures. A variety of such methods have been introduced, none of which has stood the test, and they have vanished without leaving a trace of value behind. Such, for example, was the operation of Fitzgerald, of Australia, who laced together the pillars with a gold thread; as also the double-eyed curved needle of Greenville Dowell, of Texas, were modifications of the subcutaneous idea, having no especial points of interest, and not the least appreciable merit.

At last, a combination of the open and the subcutaneous methods originated with John Wood, of London, and revived the idea of a radical cure; probably it gave more impulse to the subject than anything which had been done in many years; but, since we are all familiar with the details of his operation, I shall not weary your patience with a description of it. He estimates his successes at sixty-five per cent. of all operations done, and, in the cases of children alone, he places his ratio of success even greater. On this account he confines his operations to persons under thirty years of age, and, in his selection of cases, he grades them in this order:

1st. Children over five years of age who are not relieved by the use of the truss.

2d. Young adults over fourteen who are seriously impaired by the hernia. He bases this rule upon the reports of the Registrar-General of Great Britain, which show that in 1119 deaths from hernia, 23.5 per cent. had been subjected to operations for strangulation; the average rate of mortality after kelotomy in large hospitals being 48.8 per cent., and the ratio increasing with age.

3d. All reducible herniæ having thick sacs.

4th. All favorable cases of strangulation.

5th. Certain cases of irreducible herniæ where there is a tendency to strangulation.

His conclusions, drawn from his individual experience with the operation, do not differ in any material manner from the conclusions arrived at by other operators.

A. W. Mayo Robinson, F.R.C.S., of England, in a report to the British Medical Association held at Dublin in August, 1887, gives a series of twenty-six operations by Wood's method, in one-half of which cases the operation was done after the reduction of strangulation; thirteen after the truss had failed to accomplish its purpose because of irreducibility, or from the large size of the hernial aperture, the patients being incapacitated from attendance upon their duties. In all but two cases the sac was excised after ligation of its neck, the canal only sutured in those cases where it was very open; strict antisepsis, and, as a rule, not more than one or two dressings were required. The ages of these patients varied from three months to seventy-six years, and the ruptures were ventral, femoral, inguinal, and inguino-scrotal; in only one case was it deemed necessary to use a truss after the operation; two cases died from bronchitis, and the necropsy clearly proved the operation had been successful, since the site of the hernia had healed, the intestine regained its former condition, and no peritonitis had ensued. One of these patients evidently died from the ether inducing acute bronchitis.

The conclusions from his series of cases, as well as from the observations of others having experience with the operation, are:

1st. That hernia urgently demands treatment.

2d. That no one operation possesses such marked superiority as to monopolize the field.

3d. That the one most to be relied upon is that of excision of the sac after ligation of its neck as high as possible, with suture of the pillars of the canal and ring whenever widely separated.

4th. That when done with proper antiseptic precautions it is both safe and efficient, and, if the sac is properly separated from

its surroundings before it is emptied, the operation is both shortened and simplified.

But all of these operations, with the exception of one or two, have been abandoned as either dangerous or unsatisfactory, since the introduction of antiseptic principles has marked a new era in the treatment of the affection. Whilst only a few years ago the subcutaneous operation was the only one meeting with favor, now, under the rule of antisepsis, surgeons everywhere are investigating the subject, and devising new and bold operations for its cure. Recent statistics of the operation done under the antiseptic method show the low rate of mortality which has been attained. For example, at Bâle, the results of 136 operations mark the mortality of non-incarcerated hernias as low as 3.6 per cent., whilst under other methods, in the hands of Ségond and Liesrink, 273 operations had a mortality of 5.1 per cent. Evenen and Erdman report the results of 106 operations, done antiseptically, in which the sac was ligatured and removed, and then the pillars closed by suture, with absolutely no deaths. It is true, there was a recurrence to a small degree in 20 per cent., yet so small was it, that the success may be considered established. At the Sabbatsberg Hospital in Sweden, where the sac is ligated at the neck and then cut away, all under mercuric bichloride and iodoform, in six years 300 cases were admitted, of which number 200 were treated by the open method, with not a single fatal case, although some of the herniæ were very large and exceedingly difficult of management.

Surely, such results must prove convincing to the most sceptical, and should tend to inspire confidence in the progress of our art; they stand like beacon-lights along the pathway from art to science.

"In overlooking the field of modern surgical development, so much is seen of the inductive process by which ingenious theory is constructed as the apology for novelty of practice, that we regard with pleasure the more Socratic method by which a practice appears as the outcome of a great scientific principle," and thus it was when Czerney brought the subject of the open cure of hernia before the Berlin Congress in 1879, that the sur-

geons of Europe were willing to accept it when they found it based upon the scientific principle of the germ theory of disease and its antiseptic treatment: they recognized that the chief value of the open operation was its safety—due to the teachings of Lister!

Since the method introduced by Czerny may be considered as the starting-point of a new and distinct operation, I ask permission to run over a hasty description of the same:

After a most careful cleansing with a mercuric solution of 1 : 1000, and the usual method of scrubbing with soap and ether, the parts are protected by towels saturated with a bichloride solution, 1 : 2000, leaving only space sufficient for the incisions to be made: the incision, six inches in the axis of the tumor, opens the integuments, and a careful dissection exposes the sac; all hemorrhage is carefully arrested by Kocher's catgut ligatures. The sac is now separated from the adjacent tissues, and the index finger pressed along the neck until the margin of the internal abdominal ring is reached; after this, gentle but firm traction is made upon the sac so that it may be securely ligatured as high up as possible, thus obliterating the pouch of the peritoneum at the mouth of the sac. The sac is now opened, contents inspected, and, if sound, returned within the abdominal cavity, and the neck of the sac transfixed by a needle armed with a double ligature of stout silk, which is then tied tightly and the sac cut away below the point of ligation. The pillars of the inguinal ring are freshened and brought together by silver wire sutures introduced from within outward, and including the pillars with the external integument. By means of these sutures, and a few points of fine catgut interrupted sutures, the internal abdominal ring and the whole canal are obliterated; a rubber drainage tube is introduced and the skin wound carefully closed by a continuous suture of Kocher's juniper catgut. Iodoform, with antiseptic bandages, completes the dressing, of which no change is made unless the temperature indicates an elevation above 100° F. As a rule, the wire sutures are removed on the twelfth day, unless otherwise indicated. Objection has been made to his use of a silk ligature around the neck of the

sac, but there seems no valid reason why a properly prepared silk ligature should not prove perfectly innocuous. I am under the impression that Billroth advocates them in preference to catgut or any other material in this operation.

The paper of Czerny, and the discussion which followed, made such a profound sensation that we may consider it as the beginning from which the open operation took its departure; and following it, all kinds of novel methods have been introduced and advocated. Scarcely a surgeon has considered the subject without suggesting some modification or alteration, and usually without any points of material difference.

Dr. I. Lucas Championnière, in a most valuable contribution, entitled—"Cure radicale des Hernées," Paris, 1887, brought the subject before the French Society of Surgery and elicited a good deal of discussion upon the merits of the operation. The main point of interest which he made was—following the plan of Czerny—the total removal of the sac forms the basis of successful results; he does not lay any stress upon the suture of the pillars, although he always brings them in apposition and sutures with catgut.

He reported ten operations as done by himself, with no deaths and only one recurrence. He considers a mass of statistics taken from various sources of no reliable value, whilst carefully prepared results from the hands of a competent observer are of most importance. His own investigations lead him to assert that, if the operation is carefully performed under strict antiseptic precautions, it is not only absolutely free from danger to life, but that it should not be followed by any of the accidents or complications which frequently follow wound-healing, because these complications are invariably due to imperfect antisepsis. Under the rule of antisepsis he considers the open radical operation as established upon a scientific basis, and that it surpasses all other procedures yet devised for the cure of hernia. If the patient is not perfectly cured, he is certainly none the worse on account of the operation having been performed, and, presupposing a recurrence of the hernia, it is necessarily smaller than before the operation, and hence can be more easily and comfortably sup-

ported by a truss or a bandage. He formulates the following indications as justifying the operation:

1. All forms of irreducible hernia.

2. Congenital hernia with atrophy of testicle.

3. Large herniæ which cannot be retained by a properly fitting truss.

4. All forms of painful herniæ.

5. Herniæ existing in patients whose occupations subject them to the dangers of strangulation.

6. Certain social positions which would make a person prefer an operation for a cure to a palliative treatment.

7. In all cases where strangulation has taken place, and when a person is opposed to the appliances necessary in a palliative treatment.

Following the reading of this paper before the Surgical Society of Paris, in November and December, 1887, the most memorable discussion which probably ever was had upon this subject took place. The opinions of the surgeons who were present differed widely: M. Championnière was enthusiastic in the defence, whilst men of equal distinction combated the operation in no measured terms, and when the discussion closed so little had been accomplished that the subject remained *sub judice*. Championnière advocated closing the wound immediately, which was objected to by others on the ground that healing by granulation was the surest means of securing a dense cicatrix.

The conclusions drawn from the discussion and offered by L. S. Richelot, were to the effect that:

1. In inguinal hernia, as in all others, the resection of the sac is the main factor in the radical cure.

2. That the operation is easy of execution unless there are adhesions with the intestine, or in cases of old herniæ which have become strangulated.

3. That the resection of the vagino-peritoneal canal is always possible in congenital herniæ with atrophy of the testicle.

4. That resection of the vagino-peritoneal canal in hydrocele of the cord when existing without hernia should always be performed to prevent the descent of a hernia.

5. The simple operation, without mutilation, which will preserve a young person from all the infirmities of the disease, should always be done in hydroceles and congenital herniæ, just as it is done in acquired herniæ.

The same interest which had been aroused in Germany and France was also manifested in Great Britain, and at the meeting of the British Medical Association held at Dublin, in August, 1887, there were a number of interesting and instructive papers presented which elicited much discussion.

Mr. Thornley Stokes considered the open operation as vastly superior, and in every respect safer than the method of Wood or any other concealed mode of operation; that it was more easily performed, since it required only ordinary care and skill, whilst all the concealed methods necessitated an amount of dexterity not attainable by all surgeons. He objected to leaving a wire in the wound in the open operation, because he thought it always interferes with the proper support of the parts after the wound has healed. He considered the best and most permanent success dependent upon the exudation and organization of lymph, with the consequent consolidation and drawing together of the parts, assisted by the plug of twisted sac: that sutures do good only by exciting irritation, and thus producing exudation of plastic lymph; the tightness of a suture is of no value, but rather an injury, since it induces swelling of the cord and testis.

He is somewhat of an advocate of the method of Ball—which will be referred to further on in this paper—but modifies the same, in a slight degree: his operation is by an incision extending downward and inward from the external abdominal ring as far as may be necessary; in infants and young children one and a half inches, in youths and adults from two and a half to three inches. The exposed sac should be very carefully disconnected from the cord and its elements, and then included between two strong antiseptic gut ligatures and divided between them: the lower ligature closes the tunica vaginalis, if it is a portion of the sac, whilst the upper one seals the opening into the peritoneal cavity. Then the proximal portion is taken hold

of by broad catch forceps and twisted until distinct resistance is felt.

The deductions drawn from his method were the following:

1. In young children the operation should never be resorted to unless milder measures have failed, or proved inapplicable.

2. That on the ground of safety, certainty, and precision, the operation by dissection should be preferred.

3. That twisting the sac is a safe and efficient adjunct to the operation.

4. That sutures, so far as closing the canal is concerned, serve but a temporary purpose, and their chief end is to excite a sufficient lymph exudation.

5. That therefore they should not be introduced tightly, and in this way we will avoid testicular swelling.

6. That the permanent retention of wire is unnecessary, hurtful, and bad in theory as in practice.

7. That uniform support should be given for some time after the operation, but that support should be gentle and without a pad, because the pad is liable to cause absorption of the lymph which is effused.

Mr. Kendal Franks advocated a very slight modification of the Wood's operation, and reported twenty-two cases in which he had operated successfully, the youngest being a child of fifteen months, and the oldest an adult of sixty-four years. One case of four years, one of six, and one of seven. Two did not exceed twenty years; twelve from twenty to thirty, and four between thirty and forty, with one of fifty years. He advised against the subsequent use of the truss or any support. If the cases stood the crucial test of time, his method is one of remarkable success.

Mr. Arthur E. Barker considered that the main questions involved in the discussion are, whether the procedures employed in the radical cure are devoid of risk; whether they are simple, easy of execution, and capable of wide application; and further, whether they fulfil the objects for which they were designed?

The objects clearly indicated, are:

1. To free the inguinal canal and both rings from the presence

of the sac, and thus give room to close the opening accurately.

2. To strip the neck of the sac from the cord with as little disturbance as possible.

3. To cut the sac just outside of the external ring, and then reduce its tied stump accurately within the internal ring, and fasten it there by the same ligature which closed its neck.

4. To close both external and internal rings, together with the entire length of the canal, firmly with strong silk sutures.

5. To leave the fundus of the sac undisturbed in the scrotum, so as to avoid damage to the cord and testicle and injury to the vascular and nervous supply.

6. To secure primary union everywhere, so that the deep sutures shall remain unchanged and help permanently to close and control the rings and canal.

7. To obviate the use of a truss in all herniæ, save in the umbilical.

It is obvious that the proper disposal of the sac has been a mooted point with surgeons, and, as a consequence, there has been much difference of opinion as to which procedure is the best. With the sole idea of getting rid of this trouble, a novel method has been devised and much practised by Mr. C. B. Ball, of Dublin. His operation is simple, easy of execution, and offers advantages which, to my mind are worthy of much consideration. With a narrow-bladed, blunt-pointed scissors, he isolates the sac completely from the adjacent structures which comprise the cord; then, aided by the finger the separation can be carried up to the internal abdominal ring, and the peritoneum loosened from its attachments for a short distance within the ring. Having ascertained that the sac is empty—by opening it if necessary—grasp its neck with a broad catch-forceps and gradually twist it up. While this is being done the left forefinger should be used to free the upper portion of the neck, so as to insure the twist reaching well into the abdominal cavity. In ordinary cases four or five complete revolutions are sufficient, but this depends upon the thickness of the sac, and the portion grasped by the torsion forceps: the twisting should be con-

tinued until the neck is felt to be quite tight, and until it is found that further torsion would produce rupture. The forceps are now transferred to an assistant, who will maintain the twist until a stout catgut ligature is placed around the twisted neck as high up as possible, tied tightly and the ends cut off closely. Now two sutures of strong aseptic silk are passed through the skin, at a distance of about one inch from the outer edge of the wound, then on through the outer pillar of the ring, through the twisted neck in front of the catgut ligature, then through the inner pillar of the ring, and out through the skin on the inner edge. As these sutures effectually prevent the sac from untwisting, it *may be cut* off in front of them; and then a catgut drain is brought out through a counter-opening at the back of the scrotum; after this is done the two silk sutures are closed over lead plates, which lie at right angles to the wound. If considered necessary, one or two superficial sutures may be put in to close the integumental wound completely. Dry dressings are employed and retained by a double spica bandage, which is in turn painted over with a solution of silicate of potash—this keeps the dressings in place and the parts effectually at rest. The operation being completed, the dressings are allowed to remain for ten days or two weeks, at the expiration of which time the wound is commonly found healed and the sutures can be removed.

If, however, the temperature should rise, or any discharge appear, the dressing should be inspected just so soon as the indications necessitate it. Of course, the whole operation and its dressing must be done under proper and careful antiseptic precautions.

An interesting description of this method will be found in the *British Medical Journal* of December 10, 1887, this being the last paper written by Mr. Ball upon this subject. In a personal letter of February 21, 1889, he writes me that his total number of operations to that date were thirty-five, and out of that number only one had terminated fatally, which death was from tetanus supervening on the seventeenth day, after all the dressings had been removed, and the wound, which had run an aseptic course, had perfectly healed. He estimates ninety per

cent. of the cases recover, so that no truss is necessary, whilst in the others there is nothing more than a very slight protrusion at the upper ring, which is easily controlled by a light truss or support. He believes that the best results are obtained from very large herniæ, and hence he operates only on those which are of considerable size, unless there are some other special reasons for twisting relatively small herniæ. His method has been resorted to only in inguinal and femoral ruptures, and he has had no experience with the umbilical form; still, he has no doubt of its easy performance and probable success.

Objections have been urged against the operation upon the ground that there is danger of including a segment of intestine or a portion of omentum within the twist, and thus producing a concealed strangulation; but this is without foundation, and should not occur in the hands of a judicious and careful operator.

The method of W. Mitchell Banks, of Liverpool, has attracted much attention, and probably, with that of Macewen, of Glasgow, is more relied upon at the present time than any others.

In brief, it consists, in inguinal hernia, of exposing and opening the sac, returning its contents, and tying and cutting away all adherent omentum; the sac is then drawn out as far as possible and ligated with catgut as high up on the neck as practicable and cut away; then the pillars of the ring are brought together by one, two, or more silver sutures, which are to be left permanently in position. In femoral hernia the clearing and removal of the sac constitute the whole operation, since no attempt is made to close the femoral opening. In ventral and umbilical herniæ the use of the whole or a part of the sac to close the aperture, which, as a rule, is large, with no effort to approximate the edges, since none seems likely to be permanent, appears to be the proper course to pursue.

From the reports of this operation we draw the following conclusions:

Where a man can wear a properly adjusted truss it is best for him to do so.

That the operation is seldom necessary in children, since a

well-fitting truss will, in most cases, effect a cure; but in the poorer classes with large herniæ the operation is appropriate and should be done. In small femoral hernia with adherent omentum the operation should be advised and performed, because in such cases the patient is never safe from strangulation, and because the curative operation is as safe as any in surgery. This same rule applies to inguinal hernia where adherent omentum and large size of the protrusion prevent the use of a truss, and, as a consequence, the patient is useless and unhappy.

That as a rule, no one should be operated on who can wear with comfort a truss which keeps his hernia securely in position. Mr. Banks advocates the use of a truss after operations, and does not believe it will destroy adhesions, as some surgeons assert it will. His experience has taught him that in almost every case of failure of the operation the patient had neglected to wear a truss because he felt confident of a cure. Since failures are common, Mr. Banks objects to the term radical cure, and prefers to term it the surgical treatment of hernia. To guard against failures he advises against trimming or scraping the inguinal canal; in large herniæ it is so thinned that there is little left to scrape—the hole is generally large, and it is impossible to pull the pillars together by sutures; his use of the suture is simply to hold the parts together temporarily while the wound is healing, so as to prevent any protrusion from coughing or straining, because in large operations he leaves the wound quite open.

Although Mr. Banks has been cited as authority upon this operation, and a warm advocate of it, he, in reality, is decidedly opposed to being considered a partisan of this or any other method, and does not indorse its merits as a curative measure. His operations may be grouped into three tables, showing the nature of cases he has subjected to the treatment, with results:

Table I. Moderate size, non-strangulated: 52 cases, with 1 death due to operation.

Table II. Very large, not capable of support by truss: 16 cases, with 4 deaths due to operation.

Table III. Strangulated hernia: 38 cases, with 3 deaths.

Combining Table I. with Table III., giving 52 cases of moderate size, non-strangulated, with 38 cases of strangulated herniæ, the results were: 24 deaths, 44 cured, 7 partial successes, 1 probable success, with 14 absolute failures.

Of Table II., the 16 cases of very large hernia, 3 cases were absolute failures, 6 were considered partial successes, since they were enabled to follow their occupations, whilst before the operation they were absolutely unfit for work, and therefore useless. Of the remaining 7 cases in the table he makes no reference to, and hence we are justified in classing them as failures. To sum up, we find that, out of the 106 cases operated on, 68 were non-strangulated, whilst the remaining 38 were strangulated, giving, as a result, 28 deaths, 44 cures, 17 absolute failures, 17 partial cures. The important point of consideration must be made between the strangulated and non-strangulated cases, because it s obvious that, as regards the question of mortality, we must keep these two classes of cases quite distinct, whilst in a curative point of view we are justified in drawing the same conclusions from both.

The last and most recent improvement—if it can be regarded as an improvement—is the operation of Macewen, of Glasgow. This procedure is doubtless so familiar to each of you, that I will not consume further time by detailing the steps of the method employed, the chief points of which are the use of stout catgut, which is left in the tissues, and the utilizing of the crumpled-up sac as an internal abdominal pad to prevent the descent of the hernia, with restoration of the valve-like arrangement of the inguinal canal.

His operations were done under the strictest antiseptic precautions, used both before and after the operation. From his paper published in the *Annals of Surgery* for August, 1886, and his subsequent article in the *British Medical Journal* of December 10, 1887, we quote the results of his method in his own hands, showing number of cases operated upon, without any record of deaths:

Table I. Radical cure of inguinal hernia submitted to his operation, 49 cases.

Table II. Strangulated inguinal hernia followed by his special operation, 16 cases.

Table III. Radical cure of femoral hernia submitted to his operation, 2 cases.

Table IV. Strangulated femoral hernia followed by his special operation, 13 cases.

Making a total of 80 operations, without a death.

With such a record the operation stands upon its own merits, and, in the hands of its author, marks a wonderful advance upon anything yet devised for the cure of hernia.

There is, however, a grave objection to the method, for it is complicated in its details, and as a consequence is difficult of execution, requiring a special dexterity which is only attainable after long practice, hence it is not likely to come into general use among the rank and file of surgeons. His after-treatment consists in absolute rest under the strictest antiseptic dressings for at least fourteen to twenty-one days, at the expiration of which time the primary dressings are changed for looser coverings, and the patient kept in bed for four to six weeks, at the expiration of which time the patient is permitted to rise from bed but not allowed to engage in any work until the end of the eighth week, and is cautioned not to strain or lift any heavy weights until the end of the third month. After this time the patient is left to nature, and not required to wear either a truss or bandage unless his occupation be of a laborious nature, and then only a very light truss as a precautionary measure.

The last method which claims our attention is the operation of Dr. McBurney, of New York, and since it has been enjoying much attention within the past three years, it is deserving of more than a passing notice, especially so since it has some points of difference from the other procedures which have been spoken of. Under the most careful antisepsis he opens the entire canal up to the internal ring, loosens up and ligates the sac as high up on its neck as possible; this being done he closes the upper and lower angles of the integumental wound, and then packs the entire canal with gauze and iodoform, leaving it to heal by granulations. He never permits his patients to wear a truss

after the operation, as he considers the use of it positively injurious.

To March 2, 1889, he has employed his method in thirty-six cases, with only one fatal result, which he attributes to alcoholism. In three cases the wound became infected and the healing was slow; still there was no general sepsis in any of them. In one case an orchitis followed, and in one other there was a relapse of the tumor, which he attributed to insufficient ligation of the sac.

Dr. McBurney tells us that he has followed up the history of thirty-one of the cases, and the result has been thus far perfect in each one. Of the remaining four cases, two could not be found, and two were still under treatment. He claims the following advantage for his method:

1st. It is the only method by which the sac is completely obliterated.

2d. The walls are firmly united throughout their entire length.

3d. The wound being open, septic complications are avoided.

4th. The rapidity of execution renders the operation applicable to a great variety of cases.

The operation has gained considerable favor in New York, and is spoken of very highly by those who have had experience with it, and doubtless it has points of interest and value, but there is such similarity between it and the operation suggested and performed by Reischel that we cannot attribute it fairly to Dr. McBurney. It is to Reischel, Czerny, Nussbaum, and Sewel that we are indebted for the first real advances which were made in the cure of hernia. Reisel's method was to open the entire canal, tie the sac as high as possible, and leave it to fill up the canal while it healed by granulation; to this Dr. McBurney added the tampon of gauze. Czerny, Nussbaum, and Sewel ligated the sac and then cut it away. Dr. McBurney opens the sac and passes his finger far up into the internal ring, whilst his assistant takes the apex of the finger as a guide and throws the ligature just above it. This last is a procedure which has been described by Chauncy Puzey, of England, who sometimes transfixes the sac "*just above the tip of the finger*" with a large needle

armed with stout catgut, ties one side of the sac, so as to control it, then carries the same ligature around the whole neck of the sac and ties it very firmly just above the first ligature to insure against its slipping. He differs from Dr. McBurney in that he does not leave the canal open for granulation, but closes the pillars with chromicized catgut; and his most important adjunct to success is prolonged rest for at least two months, and then the use of a light truss or bandage, with a large soft pad for months.

This about covers the methods, at present in use, for the permanent cure of hernia, and they show a similarity of purpose in dealing with the sac as the main factor in the success of the operation.

The operation of ligature of the sac at its neck, with suture of the pillars of canal and ring, may be considered an established surgical procedure; still, being a comparatively new operation, a discussion of its merits will be of practical value in leading to further improvements, and with them, permanent success of the operation. With the present light before us, the most important point in the operation appears to be closing the neck of the sac as high up as possible, so as to seal up effectually the opening into the abdominal cavity. To do this completely it is necessary that the sac should be carefully separated from the adjacent tissues, and this is not always an easy matter, since oftentimes the true sac is obliterated and a new sac formed in the fibrous tissue, with the vascular and nervous distribution blended in such a manner as to render the dissection most difficult if not impossible. In such a case Macewen's operation could not be performed; and it would be impossible to twist the sac as recommended by Mr. Ball. This objection, however, does not obtain of crural and umbilical herniæ; still, since inguinal is the most frequent of the herniæ it is of importance in them. In the congenital cases it is much easier to separate the sac, and hence more possible to do a complete operation; but, since in young children the truss properly applied and long continued until the abdominal parietes have become so developed as to increase the obliquity of the canal will, in most instances, produce a perma-

nent cure, all operative procedure in children should be considered unwarrantable. In those cases, however, where an imprisoned testicle complicates the condition, the operation is unquestionably proper, and the removal of the testicle justifiable, and for the simple reason that the presence of the gland in the canal predisposes to the descent of the hernia.

Since the main point in the success of the operation appears to have been the proper disposal of the sac, it is not astonishing that operators who have given it their attention should have adopted diverse methods, each one of which has the same end in view. While Ball twists it, Macewen tucks it up, Hardie insists upon the importance of inclosing the transversalis fascia with the sac in the ligature, and I. D. Bryant splits the pillars on either side and weaves in the sac; Annandale opens the canal, ties the sac, cuts it away, and stitches the opening; on the other hand, Stokes opens the sac and then stitching the neck, the canal, and pillars together, he leaves the sac in position. Banks opens the sac, ligates the neck, cuts away the fundus and sutures the pillars; Alexander, of Liverpool, opens the canal, ligatures the sac flush with the peritoneum internally then divides the neck below the ligature, leaving the sac in the canal without suturing the ring. MacCormac advocates this plan, whilst Buchanan cuts down to the sac, slits it up longitudinally on each side of the cord, divides the front part horizontally, rolls up the upper part, with which he plugs the internal ring, and turns down the lower half to form the tunica vaginalis.

From a comparison of all the methods it is apparent that no fixed rule of procedure is established, and although the radical operation is a marked improvement in the treatment of hernia, whether free or strangulated, we cannot consider it perfected, because the methods hitherto resorted to have not proved radical in results. The operation is ideally correct, but the question arises, whether, with the uncertainty of success, the risk justifies the operation; especially so if the circumstances of the individual are such that he can content himself with the use of a properly adjusted truss?

DISCUSSION.

DR. M. H. RICHARDSON, of Boston.

My experience with the radical operation for the cure of hernia is very small. I think that at the Massachusetts General Hospital the method known as Macewen's operation is the one usually employed. I think that the younger men have not had time enough to observe the results of the radical operation, and that many of the cases operated on in the last few years, while cures thus far, will not prove to be permanent cures. My own preference has been for invagination of the sac by the method proposed by Macewen. In all of the cases of strangulated hernia that I have operated on I have dissected out the sac and stitched the rings, not using invagination in these cases. Another method which I think is a good one, and which I first saw used by Dr. Porter, of Boston, is to fold up the sac something like a compress, put it in the ring, and sew it there. In cases where this was done six or eight years ago the results have been good.

I do not believe in advocating the radical operation in trifling cases of hernia, but in cases where it is impossible to wear a truss, or where for any reason it is necessary that the man should be perfect, I think that it is justifiable to run the slight risk which statistics show is run in these cases. In a small hernia, I believe that the application of a properly fitting truss is the more conservative and better plan.

DR. D. HAYES AGNEW, of Philadelphia.

I have done most of the operations that have been proposed for the radical cure of hernia, and I think that we must speak with considerable reserve in regard to the one which promises most success. I suppose there was no procedure looking to the radical cure of hernia that started with greater prestige than that of Wutzer, but I do not believe that at present any one performs this operation. I have lived long enough to accept statistics with a good deal of reserve. While many of the statistics are very favorable, yet, in a large number of cases, the length of time between the operation and the period at which the cases are reported as permanent cures is not sufficient to justify us speaking positively upon this subject.

The operation which seems to me most philosophical is that usually

known as Barker's operation, and which has been so well described by Dr. Mastin. By this method the sac is ligated, pushed into the internal ring, and secured there by sutures, with transverse sutures passing across the canal, and bringing together the tendon of the external oblique and the conjoined tendon. My last operation was after the Barker plan, and was done two weeks ago on a femoral hernia. I think that it will be found that the omentum may be utilized as an important element in the radical cure of hernia. In the case to which I have referred, both omentum and sac were employed to close the internal ring, a portion of the omentum excised, and the stump along with it. This plug was then stitched in the usual way. Everything has gone on without any unpleasant occurrence, but it is too early to say what the ultimate result will be.

What I want especially to refer to, are the classes of cases in which we should press this operation. I think that in all cases of strangulated hernia we are justified in attempting the radical cure; and, secondly, in those rebellious herniæ which cannot be controlled by a truss and which place the lives of the patients in great risk. These two classes are proper ones for operation. I know of several deaths—some three or four—which have resulted from operation for the radical cure of hernia, so that the operation cannot be said, even with antiseptic precautions, to be regarded as free from danger.

Dr. W. W. Dawson, of Cincinnati.

I have been agreeably impressed with what Dr. Agnew has said. I believe that where life is not in jeopardy, operations for hernia should be approached with a good deal of thought and consideration. I have sometimes made the operation for radical cure myself, and I have witnessed it performed by others a number of times, but I have never come from one of these operations without feeling more or less want of satisfaction. What should be done with the sac I have never been able to decide satisfactorily. Whether we should obliterate it or remove it, is a question. I once saw one of the best surgeons that I have known cut down upon a hernia, throw a ligature around it, and close the columns of the ring, and the result was most admirable. The patient was a boy, about fifteen years of age, and the cure was all that could be desired. The very next operation of the kind which I saw, although the operation was done as skilfully, the hernia returned. In another case, on which I operated myself, inflammation occurred, peritonitis followed, and I lost my patient. In that operation I used

as much care and paid as much attention to the principles of antisepsis as I have done in any operation that I have made. Why peritonitis followed I could not tell.

When I was quite a young surgeon, I had a case of hernia in a young man where there was a large portion of omentum in the sac. The hernia was growing larger and larger, and was complicated with hydrocele. I returned the omentum and obliterated the sac. The result was most admirable. Some of my older friends told me that was rather a reckless operation, that the operation for irreducible hernia, where life was not in jeopardy, was rather an unjustifiable operation. I hardly thought so, the result was so good.

As has been stated by the essayist, there is no more important question to be discussed than that of the radical cure of hernia. The large number of persons whose lives or usefulness are abridged by hernia is amazing when we come to estimate it by statistics. If there is any way that we can make these operations safe to the patient and creditable to ourselves, then it should be done. There is a great difference between an operation done merely for convenience, or with what may be termed an æsthetic object, and one done to save life. Duty impels us to approach the last. When it is merely a question of æsthetics or abridged usefulness, the operation should be approached cautiously. I think that Dr. Mastin has instructed us by this thorough review of the subject, and there is no subject of more importance than this.

I would agree with the author that in children the radical operation is not called for. They recover without operation.

Dr. L. McLane Tiffany, of Baltimore.

I take an entirely opposite view from that expressed by the essayist. I take this view because my operations for strangulated hernia, with operation for the cure of the hernia, are much more successful now than they were formerly. The disease is, I believe, the same, but I believe that I am a better surgeon and operate in a more cleanly manner. I think that no operation for strangulated hernia is complete unless it is accompanied by an operation for the radical cure of hernia, unless it be one of those cases in which the intestine is gangrenous; then the matter may be open for discussion.

In regard to operation when the gut is not strangulated, the question at once arises in regard to the amount of hernia, the inconvenience which it gives rise to, and the circumstances of the individual. If the individual is well-to-do and can get along without a truss, all right; but

he should, I think, be given the advantages of the operation. Where the individual's life-work is interfered with, where his mode of life has to be changed because of the rupture, I do not hesitate to advise the patient to be operated upon, believing that, in the vast majority of cases—I will not say all cases, but in the vast majority of cases—the operation is, *per se*, not going to be followed by much trouble. I believe that if proper cleanliness and proper instruments are used the operation is not going to be followed by inflammation.

I do not think that any one operation is *the* operation. We have to judge each case on its merits as we are able to recognize them when brought face to face with the patient. I believe that the operation is proper. I believe that it is right to do it if the patient's habits of life and general welfare are interfered with. This is a matter which the patient and surgeon are to decide between them. The method of disposing of the sac must be decided on the operating-table. The operation spoken of, of splitting the canal, is an excellent one if there should be any sac in the canal. In nearly all the herniæ that I have operated upon I have found the canal obliterated, the one ring being opposite the other. I have usually had no trouble in at once getting into the abdomen.

In regard to operation on children, the essayist thinks that this is not proper. I see no difference in operating on a baby or anybody else; I think that where a child has a congenital hernia, that variety in which the tunica vaginalis is continuous with the abdominal peritoneum, that it is the duty of the surgeon to operate. This can be practically done without opening the peritoneum. An incision sufficiently long is made and the sac at its junction with the peritoneum exposed. Two ligatures are applied, one above and one below, and the intervening portion of sac excised. There is then a tunica vaginalis below, and a peritoneal sac above, and no peritoneal membrane between. The patient is then as he was intended to come into the world, with tunica vaginalis pinched off from the general peritoneal cavity. In one or two cases in which I have done this operation, there has been hydrocele which remained a number of months after the operation.

DR. D. W. YANDELL, of Louisville.

The title of this paper was the comparison of the various methods adopted for the radical cure of hernia. It seems to me that the discussion has wandered far away from this subject. As I understand it,

the essayist wished to compare the several methods adopted for the radical cure of this trouble. Instead of this, even my contemporary, I will not say venerable friend, Dr. Agnew, who is usually so judicial in his statements, has confined himself simply to a statement in reference to his experience and when we should operate, not the method of operating at all. So the gentleman who last spoke simply urges that the operation should be done. He has not said anything in reference to the operation that he would do, or indulged in an analysis of the methods suggested by the essayist.

I think that all here would agree that they would not operate when they can help it, and operate when they are obliged to do so. I agree that in operating on strangulated hernia we do not increase the danger by attempting the radical cure. I believe that since the introduction of antisepsis and these new methods or revival of old methods of operating, every surgeon in operating on strangulated hernia has endeavored to make a radical cure. This has been my own practice. If, however, you come to what I have done in the way of forming an opinion as to the best operation, we all agree that the operation has to be done when a man can go no longer, and the truss is no longer adequate to support the hernia. Something has to be done. So in strangulated hernia you have to operate. The question comes up, in attempting to cure a hernia, Which of all the methods is the best? It is exceedingly difficult to decide, and, in fact, no man can decide. Even when connected with a great hospital, his individual experience is small. Sometimes I have done one operation, sometimes another; and sometimes I have done an operation which I do not believe was ever done before. I have sometimes tied high up, sometimes I have tied low down; sometimes I have invaginated, sometimes I have not. Sometimes I stitch the columns, and sometimes do not. I saw Macewen do his operations, and so fell into the way of doing Macewen's operation. Those who have listened to Dr. Agnew will probably follow his method; those who have listened to Dr. Dawson will follow his plan. At the present we are just upon the threshold. But ten years from now we shall be able to arrive at some definite opinion. At present the whole matter is historical, and no one can say which is the best operation.

Dr. J. Ford Thompson, of Washington.

I have had considerable experience with operations for hernia, but not with the class of cases of most interest—that is, those that are not

strangulated. During the past five or six years I have, of course, attempted the radical cure in every case of strangulated hernia. So far as the various operations are concerned, I think that there is practically very little difference. The main point is to take out the sac. I think that suturing the pillars is useless; it is certainly so unless the edges are freshened. I have abandoned that portion of the operation. The operation which I perform is more like McBurney's than any other. This being the simplest, I shall continue to do it until some better operation is brought forward. I have never employed Macewen's operation for the reason that I have never fancied it. There seems to me a certain amount of risk in inverting the sac, especially in cases of strangulated hernia, where it is apt to be inflamed. I believe that, taking all things into consideration, the mortality of Macewen's operation will be found to be greater than that of any of the other methods.

The operation which I perform differs from that of McBurney in that I use a large drainage-tube instead of leaving the wound entirely open. I may modify my operation and pack the wound with iodoform gauze as he does. I am not a firm believer in the stability of the cicatricial tissue which closes these wounds. A couple of years ago I operated on a strangulated hernia. I cut off a portion of the omentum and ligated the sac with a double catgut ligature, and cut it away. The wound opened and I dressed it from the bottom, making practically McBurney's operation. The man remained perfectly well for six months. He then returned with a large hernia covered with a very thin tissue, apparently nothing more than the skin. The wound had healed by granulation tissue, and yet the covering of the hernia was so thin that I could almost see the gut.

Dr. Tiffany has referred to the treatment of hernia in children. I have for a number of years been attached to a large institution in which diseases of children are treated. I see a great many cases of hernia, and, while I have considered the question seriously, I have never been able to adopt the view expressed by Dr. Tiffany. He says that it makes no difference whether the patient is a child or an adult. I think that it makes a great difference. If any one watches an umbilical hernia in a child and sees how readily it is cured he will acknowledge this difference. I do not see why we cannot apply the same rules to hernia in the inguinal region. While we do meet with obstinate cases, yet, as a rule, if we can keep the intestine reduced, in a comparatively short time the hernia is cured. That is not the case with adults. The cure takes place because the child grows rapidly, and

these parts, which are naturally weak, increase in strength and retract. In some cases where the hernia is so large that it seems hopeless to expect closure of the opening, the radical operation is justifiable; but in the majority of cases of inguinal hernia in children, we should use the expectant plan entirely.

DR. W. W. KEEN, of Philadelphia.

It seems to me that while the subject of the essay which has been presented to us relates solely to the question of radical methods, it is not a bad thing that the discussion should have taken a wider range and included two topics—not only that of method, but also the question whether or not we should do any operation for the radical cure of hernia. All of us certainly agree that in strangulated hernia no operation is complete unless the radical cure has been attempted. A second class of cases in which the operation is indicated is that referred to by Dr. Agnew, in which the patient is entirely unable to labor. I think, however, that at the present time we are not disposed to limit operative interference in hernia to these two classes of cases, but that the profession, slowly it is true, but I think surely, is tending toward enlarging the bounds of this operation, not perhaps to the degree that every case of hernia should be operated on, but we are tending in that direction. We are gradually tending to include those cases in which there is less and less inconvenience, and to operate on a larger number of these cases.

The safety of the open method is certainly shown by statistics, not individual, but collected by a great many. Our distinguished friend from Cincinnati has said that hernia does not imperil life. I would scarcely agree with him. We all teach that strangulation most frequently occurs in old herniæ. The hernia gradually increases in size, and suddenly, as the result perhaps of exertion, strangulation takes place. It is true that a non-strangulated hernia, fairly retained by a truss, does not involve any serious risks to life, but there is constantly an impending risk, larger, I think, than that of an open wound. Hence the tendency to operate upon a larger number of these cases. I would not go so far as to say that I would operate upon all cases, and that I should operate on children. If, however, in the case of a child the retentive apparatus had been fairly tried for a considerable time, especially if the child belongs to a class in which he will probably be compelled to earn his bread by daily labor, there I think it would

be right, after the lapse of a reasonable time, to operate. By a reasonable time I do not mean a few weeks or even possibly a few months; I think that the trial should be prolonged for a few years. If a radical cure has not then been effected by retentive measures, I should be inclined to operate.

In regard to the choice of method, I should like to say only a word or two. If the hernia is very large, I should not be disposed to use Macewen's method. Some two years ago I reported a case in which I used this method on a large labial hernia, operated on at the Woman's Hospital, Philadelphia. The sac was large, and I think that I was indiscreet in using this method. The life of the sac is imperilled by separating it, and if it is large it is almost certain that a portion of it will slough. Macewen's operation should be limited to herniæ of moderate dimensions.

Another point in connection with large herniæ is the importance of preparatory treatment. Only day before yesterday, I had presented to me a man with a large scrotal hernia, reaching to the knee, which had existed for twenty-five years. In these cases the intestines, so to speak, lose their "right of domicile" in the abdominal cavity. In many of these cases the wall of the abdomen contracts to such an extent that the reduction of the hernia *en masse* at a single sitting is sometimes very dangerous. I have known of more than one case of strangulation of a hernia of this kind in which reduction has been effected under ether, and the patient has been in danger of suffocation in consequence of the pressure on the diaphragm. In the case seen two days ago, I succeeded at the first sitting in getting the intestine within the abdomen. I shall, however, certainly not operate for two or three weeks. Not only do I want to be sure that there will be no danger to respiration, but I want the abdominal walls to relax and become accustomed to the presence of the intestines in order that there shall be no strain upon the stitches, tearing them out. In the more ordinary cases and in the large domain into which the operation is gradually extending, I certainly think that the operation of McBurney is the best. It seems to me that Dr. Mastin in describing this operation omitted one step, that is, the sewing of the layers of the abdominal wall on each side together. The pillars, muscles, and skin are united by a number of stitches; this gives solidity to the wall, and then the walls are approximated by cross sutures. The two portions of the wound are so held together that they are not separated on violent expiratory efforts, as in coughing or in vomiting, so that the opening shall not be too

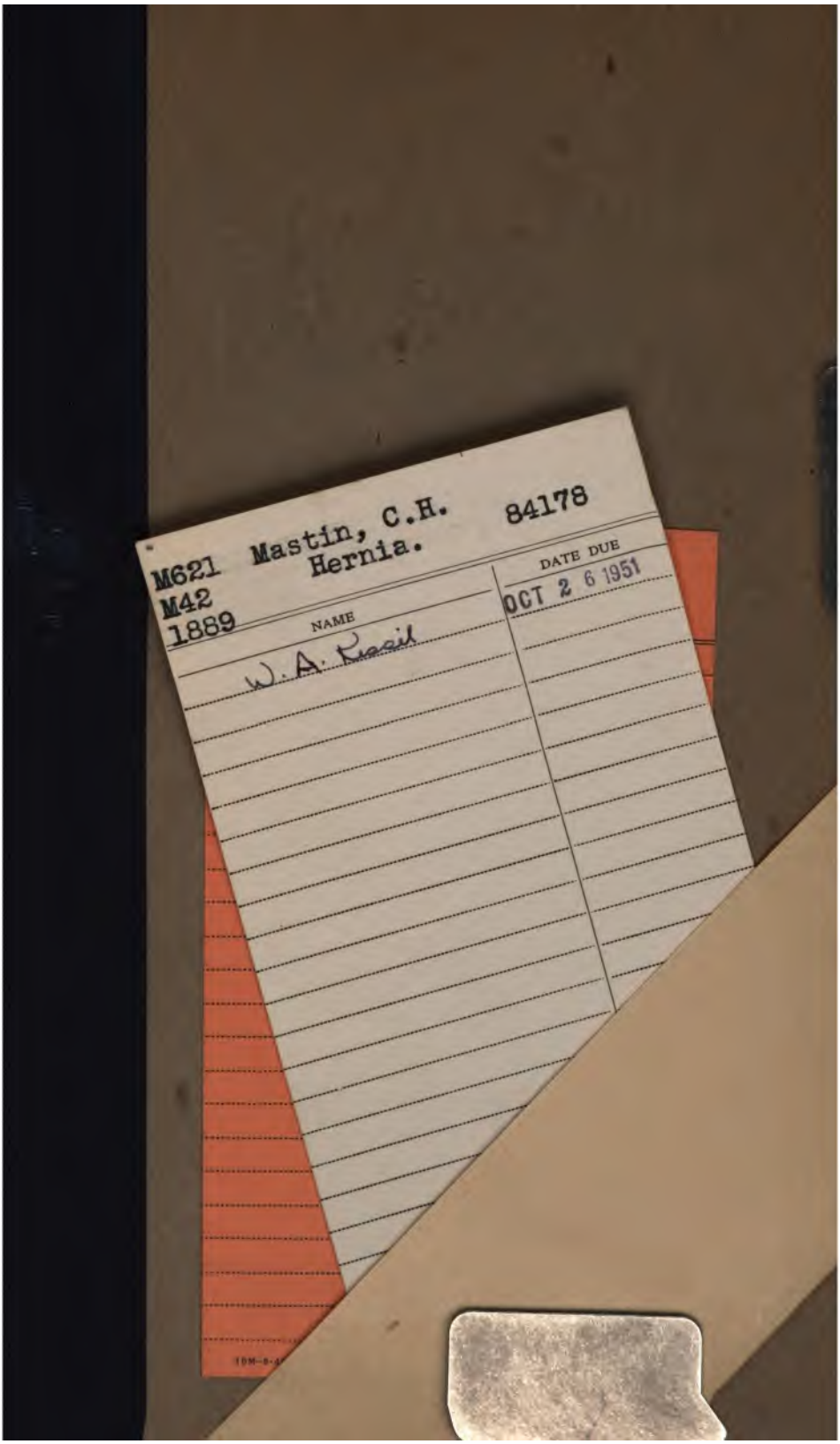
large and tend to a reproduction of the hernia. For my own part I should certainly choose from among the various operations the open method, and among these I should select either McBurney's, Macewen's, or Mr. Ball's.

DR. J. R. WEIST, of Richmond, Ind.

I have operated on forty-one cases of strangulated hernia and in about thirty of these I have made efforts to effect a radical cure. I have tried various methods, but in only four cases have I succeeded in keeping the hernia back. In a number of cases there was no return for six months or two years, but finally the hernia reappeared and was as bad as ever.

DR. MASTIN. I have nothing to add to what I have already written, save mentioning my own operations, to which I did not refer. The object of the paper was solely to draw a comparison of the various methods now in use, and to ascertain the sense of the Association as to their respective merits. I am, of course, an advocate of antiseptic treatment. My experience with hernia has been a rather strange one. I have operated on thirty-four cases of hernia with three deaths. All were cases of strangulated hernia. I should exclude two of these deaths because the patients were *in extremis* when the operations were done. This would leave thirty-two operations with one death. Of the thirty-one cases which recovered, a radical cure was obtained in only eight cases. One of these cases of radical cure I have watched for seventeen years, and the results have been perfect, no truss being used. The operation which I did in all these cases was to secure the sac with a large pin, the ordinary acupressure pin, passed down through the pillars and the sac, with a twisted suture over it, the incision then being closed with interrupted sutures, and the leg laid over a double inclined plane after dressing with spica bandage. Thirty cases have recovered with primary union. In only one was there any suppuration, and that was the one in which I used the strictest antiseptic methods; and this was probably the patient best situated so far as hygienic surroundings were concerned. In this case there was considerable suppuration, and eight ounces of grumous pus were discharged at the first dressing. I believe that the cure in these cases is produced by dense cicatricial tissue formed in the canal, and not by any direct treatment of the sac itself. Under existing circumstances, and with all the lights before me, my preference is for the operation of Ball, of

[illegible] one most easy of execution and less liable to induce [illegible]e inf[illegible]ion. I consider the operation of Macewen difficult [illegible]xecute, a[illegible] liable to fatal necrosis of the sac itself. The operation [illegible]ch is attributed to Banks, of Liverpool, is probably the one best [illegible]ed to the general operator, and the one which would meet with [illegible]st general favor. The operation of Reischel, so-called "the McBur[illegible]ey operation," is one which will give the greatest amount of cicatricial tissue, resulting from long granulation, and on this account probably offers the most radical results. But at this date the operation which is best calculated to offer *general* satisfaction remains a mooted question, and until more accurate experience decides it the selection of the special operation must remain still *sub judice*.


M621
M42
1889
Mastin, C.H.
Hernia.
84178
NAME
W. A. Keail
DATE DUE
OCT 2 6 1951